

PATENT
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Atty Docket No.: A01463

In re application of: Brian Michael Bridgewater et al.

Confirmation No. 3734

Serial No.: 10/700,078

Group Art Unit: 1714

Filed: November 3, 2003

Examiner: Vickey Ronesi

For: Aqueous Coating Composition Comprising Emulsion Polymer Formed In The
Presence of Thermal Initiator And Neutralizer

DECLARATION OF RALPH CRAIG EVEN UNDER 37 C.F.R. §1.132

I, Ralph Craig Even, declare that the following is true and accurate and that I make this declaration of my own free will, as follows:

The Declarant

1. My name is Ralph Craig Even, and I currently reside at 1424 Mauck Road, Blue Bell, PA 19422. I received my B.A. in Chemistry from Franklin and Marshall College in 1981. I am a named inventor on the above-mentioned patent application.

2. I have been employed by Rohm and Haas Company since 1981, for the most part as a Senior Chemist in Emulsion Polymer Synthesis. My primary job responsibility over that 26-year period was the experimental design and synthesis of new emulsion polymers and their evaluation, specifically in their use in the Coatings industry. During that time, I performed many syntheses and evaluations of emulsion polymers and had others perform such work under my direction, including the synthesis and evaluation of the emulsion polymers of this Patent Application and those presented in this Declaration.

The September 15, 2005 Office Action

3. I have reviewed the Office Actions in the above-mention patent application and understand that the instant claims 1-5 and 7-9 stand rejected as obvious over Friel et

al. (US 5,731,377). The rejection has cited case law to the effect that "even though the product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself".

Polymers Prepared

4. Under my direction, the following six (6) emulsion polymers, shown in Table 1, below, were prepared by a thermal polymerization process run at 88 C. Each polymer had the same monomer composition as follows: 57 BA / 40 MMA / 2 MAA / 1 Ureido monomer. The polymers were prepared in pairs, a comparative polymer and an inventive polymer comprising each pair, using a process detailed as shown in Table 1 and in paragraph 5, below:

Table 1

Polymer		Total Initiator	Initiator		Neutralizer		Feed Time
			Kettle	CoFeed	Kettle	CoFeed	
AH0301	Comp. - Friel Ex.3	0.25%	0.15%	0.10%	8.0%	0	1.5 hr
AH0303	Inv. - cofeed analog	0.25%	0.05%	0.20%	0.4%	7.6%	1.5 hr
AH0331	Comp. - long feed, high initiator/neutralizer	0.30%	0.18%	0.12%	56.0%	0	3.5 hr
AH0307	Inv. - long feed, high initiator/neutralizer	0.30%	0.07%	0.23%	2.4%	53.6%	3.5 hr
AH0309	Comp. - long feed, low initiator	0.05%	0.03%	0.02%	56.0%	0	3.5 hr
AH0311	Inv. - long feed, low initiator	0.05%	0.01%	0.04%	0	56.0%	3.5 hr

5. Emulsion AH0301 was made by the process of Friel et al., in Example 3 of US 5,731,377. Emulsion AH0303 has the same monomers and quantities of initiator and neutralizer; however, the polymerization is run by the instantly recited process of claim 2. In particular, the Friel process employs the majority of the initiator and neutralizer at the start of the polymerization (and thus the majority is present during the first 10% by weight of the conversion of monomers to emulsion polymer), which can be referred to as

Kettle biased, whereas the inventive process employs the majority of the initiator and neutralizer in the co-feed, which can be referred to as co-feed biased. In the other two pairings, the comparative Friel process uses the kettle biased addition of initiator and neutralizer, whereas the inventive process uses the co-feed biased addition of initiator and neutralizer (see amounts in the kettle and co-feed in Table 1).

6. Sample AH-0301 (Comparative) is a reproduction of Friel's Example 3, cited as art, with total initiator level of 0.25%, based on dry polymer weight, and 8% neutralizer, based on acid monomer. Sample AH-0303 (Inventive) has the same monomer composition and the same initiator and buffer levels as Friel, but is run by the inventive process instead of the prior art process. Other polymerizations were run in order to compare polymers made using the process of Friel and the inventive polymers using the instantly claimed inventive process. Thus, comparisons were made at total initiator levels of 0.3%, based on dry polymer weight, and using 56% neutralizer, based on acid monomer (AH-0331, Comparative, and AH-0307, Inventive) and also at total initiator levels of 0.05%, based on dry polymer weight, and using 56% neutralizer, based on acid monomer (AH-0309, Comparative, and AH-311, Inventive). The comparisons directly address the Friel art at both the top and bottom of the instantly recited initiator range level. See, for example, claim 2: "...wherein said initiator is used in the amount of 0.05 to 0.3%, by weight, based on dry polymer weight..." The data again shows that the product-by-process is different.

7. The polymers were studied by GPC-MALS (Gel Permeation Chromatography with Multi Angle Light Scattering). Detection was by a MALS-Wyatt HELEOS refractive index detector (from Wyatt OptiLab rEX). Gel permeation chromatography separation techniques yield longer elution times for smaller molecules. Conventional emulsion polymerizations, such as that of Friel, result in very high molecular weight polymers, which tend to pass through the column in one elution time. The GPC-MALS traces for the six (6) emulsion polymers in Table 1 are attached, as Appendix A. The GPC-MALS traces show that the products of the inventive process are different to those produced in Friel et al.. For each pairing, the inventive process has a much more pronounced elution due to low molecular weight polymers.

8. As shown in the GPC-MALS data, the inventive process yields an effective amount of a lower molecular weight component in addition to a very high molecular

weight material. For each pair, the polymer resulting from the inventive process has a much greater amount of the low molecular weight polymer component (higher elution time component, at elution times of approximately 46-49 minutes) compared to the comparative prior art process of Friel. This gives improved diffusion between latex polymer particles and a more fully coalesced system (without the use of coalescents or added volatile organic compounds, VOC), thereby resulting in a more homogeneous film for the polymer formed by the inventive process, relative to that formed by the prior art process, when film formation of this hard (high Tg) polymer composition occurs at ambient temperature. This equates to improved scrub resistance and dirt pickup resistance, both of which are important properties for decorative and functional coatings

9. In conclusion, the foregoing data directly compares the instantly recited invention of claim 2 to the cited closest art of Friel et al. and demonstrates that the instantly recited product-by-process of claim 2 makes a composition that differs from the product made by Friel et al.. Moreover, although Friel does not mention the use of a chain transfer agent, it is clear that even if one allows the additional use of chain transfer agent in the Friel process, this would still produce a different product from that resulting from the process of instantly recited claim 1.

10. The data presented herein explores initiator levels equal to the level of the Friel et al. reference, and also at both the top and the bottom extreme of the instantly recited initiator range. As one skilled in the art, I find that the original data, along with the data contained herein, demonstrates in a manner reasonably commensurate with the scope of the claims that the instantly recited invention makes a different product from that of Friel et al.

Statement Under 28 U.S.C. §1746

11. I declare that all statements made in this declaration of my own knowledge are true. I believe that all statements made herein on information and belief also are true. Furthermore, I understand that willful false statements and the like so made are punishable by fine or imprisonment, or both, under the United States Code, and such willful false statements may jeopardize the validity of any patent application or patent that may issue on this patent application.

Dated: 12/21/2007

Ralph Craig Even
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APPENDIX A: GPC-MALS Data





